

# New species of lichenicolous fungi for Ukraine

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**Abstract:** The lichenicolous fungi *Abrothallus teloschistis*, *Ceratobasidium bulbillifaciens*, *Cladosporium licheniphilum*, *Cornutispora ciliata*, *Epicladonia sandstedei*, *Lichenohendersonia varians*, *Lichenothelia renobalesiana*, *Stigmatidium clauzadei*, *Vouauxiella verrucosa*, *Zwackhiomyces berengerianus* are reported for the first time for Ukraine. Descriptions, localities, ecology and distribution of the recorded species are provided.

**Keywords:** new records, Ascomycota, Basidiomycota, Eastern Europe

## INTRODUCTION

Southern Ukraine includes plain and mountain territories covered by different types of landscapes. There are *Festuca–Stipa* and *Artemisia*–steppes, steppes with limestone, siliceous and loesses outcrops, sand dunes and maritime splits, small nature and artificial forests in plain part. The mountain landscapes are presented by the Crimean Mountains and Southern Crimean coastal with submediterranean climate. These landscapes are important lichen habitats, and therefore they also provide conditions for lichenicolous fungi. The new species *Pronectria caloplacae* Khodos. et al., *P. diplococca* Kocourk. et al. (Khodosovtsev et al., 2012) and *Pleospora xanthoriae* Khodos. & Darmostuk (Khodosovtsev, Darmostuk, 2016) were described here. Several new Ukrainian records of lichenicolous fungi have been published from these landscapes during the last years (Khodosovtsev, 2013; Khodosovtsev et al., 2013; Khodosovtsev & Klymenko, 2015; Darmostuk, 2015; Naumovych & Darmostuk, 2015). The information about locations of ten new for Ukraine lichenicolous fungi which were collected mainly from the southern part of the country are presented in this contribution.

## MATERIAL AND METHODS

Specimens were examined using standard microscope techniques and LOMO microscopes MBS–2 and MICROMED–2. Microscopical examination was done in water, 10% KOH (K), Lugol's iodine, directly (I) or after a KOH pretreatment (K/I) or Brilliant Cresyl blue (BCr). Photographs were taken with camera Levenhuk

C510 NG. All examined specimens are deposited in the lichenological herbarium of Kherson State University (KHER). In distribution data for all species only the first record in each country is noted.

## THE SPECIES

ABROTHALLUS TELOSCHISTIS Brackel, Pérez–Ortega & Sujja

**Specimen examined.** Ukraine, Autonomous Republic of Crimea, Arbatskaya Strelka, near the fortress Arabat, 45°17'43.64"N, 35°28'21.23"E, alt. 1 m, on thallus of *Seirophora lacunosa* which was infected also by *Lichenocodium erodens*, 10 June 2003, A. Khodosovtsev (KHER 9309).

Notes – Recently described from Europe (Italy) and North America (Cuba) (Brackel, 2015). New to Eastern Europe.

CERATOBASIDIUM BULLILLIFACIENS Diederich & Lawrey (Fig. 1A).

**Specimens examined.** Ukraine, Kherson region, Goloprystanskiy district, village Burkuty, 46°22'02.9"N, 32°46'29.7"E, alt. 26 m, on thalli of *Xanthoria parietina*, on *Populus tremula*, 9 April 2008, A. Khodosovtsev (KHER 9507); Velykooleksandrivkiy district, village Mala Oleksandrivka, right bank of river Ingulets, 47°17'38.47"N, 33°16'24.21"E, alt. 21 m, on *Circinaria calcarea*, on limestone, 3 July 2015, V. Darmostuk (KHER 9483); Mykolayiv region, Bashtanskiy district, village Maryivka, 47°10'22.79"N, 32°14'56.44"E, alt. 15 m, on *Lasallia pustulata*, on granite, 8 July 2004, I. Moysiyyenko (KHER 1387).

Notes – Widespread in Western and Central Europe: Belgium, France, Germany, Luxembourg, the Netherlands and Sweden (Diederich et al., 2014b). New to Eastern Europe.

CLADOSPORIUM LICHENIPHILUM Heuchert & U. Braun  
**Specimens examined.** Ukraine, Kherson region, Goloprystanskiy district, village Kardashynka, 46°33'16.03"N, 32°37'13.17"E, alt. 3 m, on thallus of *Xanthoria parietina*, on *Armeniaca vulgaris*, 6 January 2015, A. Khodosovtsev (KHER 9501); Tsurupinskiy district, village Proletarka, 46°38'49.7"N, 32°59'37.1"E, alt. 13 m, on thallus of *Xanthoria parietina*, on *Populus tremula*, 5 April 2008, A. Khodosovtsev (KHER 6187); Goloprystanskiy district, village Promin, near lake Shelemens'ke, 46°20'15"N, 32°49'07"E, alt. 26 m, on *Xanthoria parietina*, on *Populus tremula*, 21 November 2015, A. Khodosovtsev & V. Darmostuk (KHER 9430).

Notes – Known on various lichens in Europe: Estonia (Suija et al., 2011), Germany (Brackel, 2009), Italy (Brackel, 2008), Lithuania (Motiejūnaitė et al., 2012), Norway (Brackel, 2009); Asia: India (Zhurbenko, 2013a), Russia (Heuchert & Braun, 2006).

#### CORNUTISPORA CILIATA Kalb

**Specimens examined.** Ukraine, Kherson region, Berislavskiy district, Kamyanskiy beam, 47°03'31.90"N, 33°35'11.50"E, alt. 35 m, on apothecia of *Xanthoria parietina* together with *Lichenocodium xanthoriae* M.S. Christ., on *Robinia pseudoacacia*, 30 September 2015, V. Darmostuk (KHER 9504).

Notes – Recorded from Europe: Austria (Berger et al., 1998), Belgium (Diederich et al., 2014a), Germany (Brackel & Kocourková, 2006), Luxembourg (van den Boom et al., 1996), the Netherlands (van den Boom, 2002), Norway (Alstrup et al., 2008), Poland (Kukwa & Flakus, 2009), Spain (Etayo, 1996), Sweden (Thell et al., 2014); Asia: Japan (Zhurbenko et al., 2015), Russia (Zhurbenko, 2012); Africa: (Spain), Canary Islands (Hafellner, 1996); North America: Canada (Cole & Hawksworth, 2001), USA (Gierl & Kalb, 1993); South America: Chile (Etayo & Sancho, 2008); Australia: Tasmania (Gierl & Kalb, 1993), New Zealand (Kalb et al., 1995). New to Eastern Europe.

#### EPICLADONIA SANDSTEDEI (Zopf) D. Hawksw.

**Specimen examined:** Ukraine, Kherson region, Velykooleksandrivkiy district, village Mala Oleksandrivka, Rusova beam, 47°16'15.93"N, 33°14'05.43"E, alt. 37 m, on thallus of *Cladonia foliacea*, on soil, 10 January 2016, V. Darmostuk (KHER 9512).

Notes – Known from Europe: Austria (Mayrhofer et al., 1989), Belarus (Tsurykau et al., 2014), Belgium (Diederich et al., 1991), Czech Republic (Bachmann, 1927), Denmark (Alstrup & Svane, 1998), Estonia (Suija et al., 2010), France (Hawksworth, 1981), Germany (Sandstede,

1906), Great Britain (Hawksworth, 1981), Italy (Brackel, 2013), Lithuania (Motiejūnaitė, 1999), the Netherlands (Brand et al., 2013), Norway (Sandstede, 1931), Poland (Czyżewska et al., 2005), Russia (Zhurbenko & Himelbrant, 2002), Spain (Alvarez & Carballal, 1992), Sweden (Hawksworth, 1981), Switzerland (Hawksworth, 1981); Asia: Russia (Zhurbenko, 1998); North America: Canada (Scholz, 1998), USA (Cole & Hawksworth, 2001); South America: Chile (Diederich, 2003); Faeroe Islands (Alstrup & Christensen, 1999).

#### LICHENOENDERSONIA VARIANS Calatayud & Etayo (Fig. 1C).

**Specimen examined:** Ukraine, Zaporizka region, Pryazovs'kiy district, village Makivka, 47°01'17.35"N, 35°56'51.96"E, alt. 67 m, on thallus of *Candelariella vitellina*, on exposed bark of *Robinia* near siliceous rocks outcrops, 8 October 2010, A. Khodosovtsev & T. Zavyalova (KHER 6293).

Notes – Known from few localities in Spain (Calatayud & Etayo, 2001) growing on saxicolous lichens such as *Acarospora epithallina* H. Magn., *A. hilaris* (Dufour) Arnold, *Rhizoplaca chrysoleuca* (Sm.) Zopf and *Lecanora valesiaca* (Müll. Arg.) Stizenb. *Candelariella vitellina* is a new host species. New to Eastern Europe.

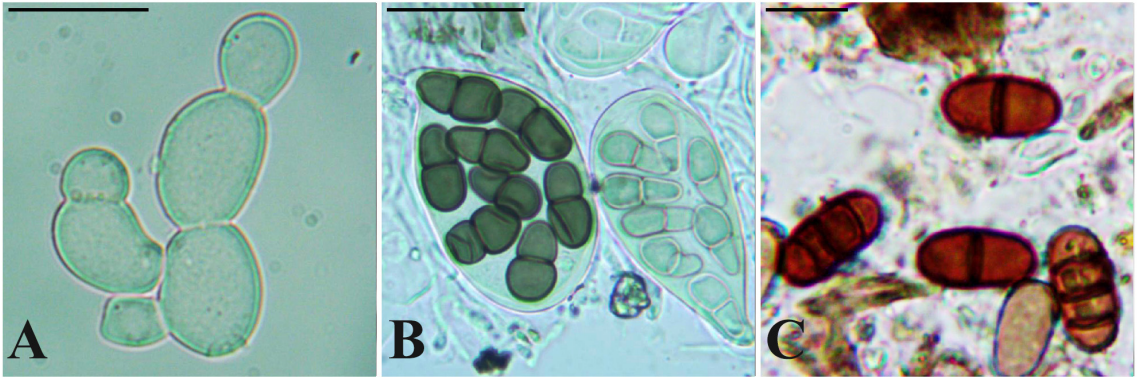
#### LICHENOTHELIA RENOBALSIANA D. Hawksw. & V. Atienza (Fig. 1B).

**Specimens examined.** Ukraine, Autonomous Republic of Crimea, Simferopolskiy region, Mt Chatyrdag, lower plateau, 44°44'17.68"N, 34°17'34.06"E, alt. 900 m, on *Bagliettoa* sp., on limestone, 2 October 1999, A. Khodosovtsev (KHER 7006); Sudakskiy region, Sudak, opposite the tourist base "Horizont", 44°49'46.90"N, 34°54'51.08"E, alt. 100 m, on *Bagliettoa* sp., on limestone, 22 July 1999, A. Khodosovtsev (KHER 0858).

Notes – Known from Europe: Austria (Atienza & Hawksworth, 2008), Belgium (Atienza & Hawksworth, 2008), Estonia (Martin et al., 2012), France (Atienza & Hawksworth, 2008), Germany (Atienza & Hawksworth, 2008), Great Britain (Atienza & Hawksworth, 2008), Slovenia (Atienza & Hawksworth, 2008), Spain (Atienza & Hawksworth, 2008); Asia: Russia (Urbanavichus et al., 2011); Africa: Morocco (Atienza & Hawksworth, 2008); North America: USA (Kocourková & Knudsen, 2009).

#### PESTALOTIOPSIS SP. (Fig. 2).

**Specimen examined.** Ukraine, Autonomous Republic of Crimea, Sudakskiy district, cape Meganom, 44°47'41.48"N, 35°04'39.56"E, alt. 63 m, on thallus



**Fig. 1.** A – hyphal cells in squash bulbil of *Ceratobasidium bulbifaciens*; B – asci and ascospores of *Lichenothelia renobalesiana*; C – conidia of *Lichenohendersonia varians* (all in water). Scale bars: A – 25  $\mu\text{m}$ ; B – 50  $\mu\text{m}$ ; C – 10  $\mu\text{m}$ .

of *Squamarina lentigera*, on soil, 2 May 2002, A. Khodosovtsev (KHER 6957).

Notes – Only few pycnidia were present, 150–200  $\mu\text{m}$  diam., immersed in lobes of the host. Conidiogenous cells ampulliform or lageniform, hyaline. Conidia fucoid, ellipsoid, straight, 4-septate, 20–26  $\times$  9.5–14.5  $\mu\text{m}$ , basal cell obconic, hyaline; apical cell 3–5  $\mu\text{m}$  long, hyaline, subcylindrical, with 3 tubular apical appendages, arising from an apical crest, unbranched, filiform, 30–50  $\mu\text{m}$  long, basal appendage single, tubular, short, unbranched, centric, 2–3  $\mu\text{m}$  long.

*Pestalotiopsis* is generally not a lichenicolous genus, but *Pestalotiopsis maculans* (Corda) Nag Raj was cultured from some North American lichens (Sun et al., 2002) and *Pestalotiopsis* sp. was found in *Dirinaria picta* (Suryanarayanan et al., 2005). *Pestalotiopsis* is considered en-

dolichenic in both above mentioned cases. Our specimen has wide conidia (> 10  $\mu\text{m}$ ) which is unknown in *Pestalotiopsis* species so far (Maharachchikumura et al., 2014).

STIGMIDIUM CLAUZADEI Cl. Roux & Nav.–Ros.

**Specimen examined.** Ukraine, Kherson region, Bilozerskiy district, village Fedorivka, 46°48'19.17"N, 32°47'52.55"E, alt. 10 m, on thallus of *Verrucaria viridula*, on limestone, 25 May 1995, A. Khodosovtsev (KHER 9511).

Notes – Reported from Europe: Denmark (Søchting et al., 2007), Estonia (Suija et al., 2011), France (Roux & Navarro-Rosines 1994), Germany (Brackel, 2009), Great Britain (Hitch, 2007), Luxembourg (Sérusiaux et al., 1999), the Netherlands (Brand et al., 2013), Poland (Kukwa & Czarnota, 2006) and Spain (Roux & Navarro-



**Fig. 2.** *Pestalotiopsis* sp.: A, B – conidia. Scale bars: A, B – 25  $\mu\text{m}$ .

Rosines, 1994); Asia: Russia (Urbanavichus & Urbanavichene, 2015).

VOUAUXIELLA VERRUCOSA (Vouaux) Petr. & Syd.

**Specimen examined.** Ukraine, Autonomous Republic of Crimea, Sudakskiy district, village Novyy Svit, 44°49'29.46"N, 34°54'30.26"E, alt. 61 m, on apothecia of *Lecanora* cfr. *alophana*, on bark of *Juniperus excelsa*, 9 July 2001, A. Khodosovtsev (KHER 6769, 9355).

Notes – Known from Europe: Austria (Türk & Wittmann, 1987), 1981), France (Bouly de Lesdain, 1907), Germany (Triebel & Scholz, 2001), Great Britain (Hawksworth, Greece (Hawksworth, 1981), Italy (Brackel, 2011), Portugal (Hafellner, 1995), Spain (Hawksworth, 1981), Sweden (Hawksworth, 1981); Asia: Pakistan (Hawksworth, 1981); Africa: Morocco (Hafellner, 1996); North America: USA (Diederich, 2003); Azorean archipelago (Berger, Priemetzhofer, 2008). New to Eastern Europe.

ZWACKHIOMYCES BERENGERIANUS (Arnold) Grube & Triebel

**Specimen examined.** Ukraine, Odessa region, Kominternovskiy district, village Serbky, 47°03'27.83"N, 30°57'58.57"E, alt. 27 m, on *Mycobilimbia sabuletorum*, on limestone, 2 May 1996, A. Khodosovtsev (KHER 9648); Zakarpatska region, Carpathian Biosphere Reserve, near river Velyka Uholka, 48°13'19.37"N, 23°42'39.16"E, alt. 814 m, on *Mycobilimbia sabuletorum* above limestone, 15 July 2010, O. Nadyeina (KHER 9528).

Notes – Known from Europe: Austria (Arnold, 1871), France (Grube & Hafellner, 1990), Germany (Lettau, 1958), Great Britain (Grube & Hafellner, 1990), Italy (Hawksworth, 1983), Netherlands (Brand et al., 2013), Norway (Zhurbenko & Brackel, 2013), Poland (Kukwa & Flakus, 2009), Russia (Zhurbenko, 2004), Sweden (Grube & Hafellner, 1990); Asia: Russia (Zhurbenko & Santesson, 1996); North America: Canada (Zhurbenko, 2013b), USA (Zhurbenko et al., 1995).

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## REFERENCES

- Alstrup, V. & Christensen, S. N. 1992. The NLF-exursion to the Faeroe Islands 1995. *Graphis Scripta* 8: 25–29.
- Alstrup, V., & Svane, S. 1998. Interesting lichens and lichenicolous fungi from northeast Jutland, Denmark. *Graphis Scripta* 9(1): 23–25.
- Alstrup, V., Grube, M., Motiejūnaitė, J., Nordin, A. & Zhurbenko, M. 2008. Lichenicolous fungi from the Skibotn area, Troms, Norway. *Graphis Scripta* 20: 1–8.
- Alvarez, J. & Carballal, R. 1992. Líquenes y hongos liquenícolas interesantes de la Sierra de Caurel (Lugo, noroeste de España). *Cryptogamie. Bryologie, lichenologie* 14: 303–320.
- Arnold, F. 1871. Lichenologische Ausflüge in Tirol 6. Die Waldrast. *Verhandlungen der Zoologisch-Botanischen Gesellschaft in Wien* 21: 1103–1148.
- Atienza, V. & Hawksworth, D. L. 2008. *Lichenothelia renobalesiana* sp. nov. (Lichenotheliaceae), for a lichenicolous ascomycete confused with *Polycoccum opulentum* (Dacampiaceae). *The Lichenologist* 40: 87–96. <http://dx.doi.org/10.1017/S0024282908007342>
- Bachmann, E. 1927. Das Verhältnis flechtenbewohnender Pilze zu ihren Wirtspflanzen. *Archiv für Protistenkunde* 58: 143–172.
- Berger, F. & Priemetzhofer, F. 2008. Neufunde und interessante Nachweise von Flechten und flechtenbewohnenden Pilzen von den Azoren. *Herzogia* 21: 125–146.
- Berger, F., Priemetzhofer, F. & Türk, R. 1998. Neue und seltene Flechten und lichenicole Pilze aus Oberösterreich, Österreich IV. *Beiträge zur Naturkunde Oberätsteteichs* 6: 397–416.
- Bouly de Lesdain, 1907. Lichens des environs de Versailles. *Bulletin de la Société botanique de France* 54: 680–698.
- Brackel, W. von. 2008. *Zwackhiomyces echinulatus* sp. nov. and other lichenicolous fungi from Sicily, Italy. *Herzogia* 21: 181–198.
- Brackel, W. von. 2009. Flechtenbewohnende Pilze in Bayern IV. *Berichte der Bayerischen Botanischen Gesellschaft* 79: 5–55.
- Brackel, W. von. 2011. Lichenicolous fungi and lichens from Puglia and Basilicata (southern Italy). *Herzogia* 24: 65–101. <http://dx.doi.org/10.13158/heia.24.1.2011.65>
- Brackel, W. v. 2013. Miscellaneous records of lichenicolous fungi from the Italian Alps. *Herzogia* 26: 141–157. <http://dx.doi.org/10.13158/heia.26.1.2013.141>
- Brackel, W. von. 2015. Lichenicolous fungi from Central Italy with notes on some remarkable hepaticolous, algicolous and lichenized fungi. *Herzogia* 28: 212–281. <http://dx.doi.org/10.13158/heia.28.1.2015.212>
- Brackel, W. von. & Kocourková, J. 2006. *Endococcus karlstadtensis* sp. nov. und weitere Funde von

- flechtenbewohnenden Pilzen in Bayern—Beitrag zu einer Checkliste II. *Berichte der Bayerischen Botanischen Gesellschaft* 76: 5–32.
- Brand, A. M., Sparrius, L. B. & Aptroot, A. 2013. Nieuwe soorten korstmossen en lichenicole fungi voor Nederland. *Buxbaumia* 97: 17–22.
- Calatayud, V. & Etayo, J. 2001. Five new species of lichenicolous conidial fungi from Spain. *Canadian Journal of Botany* 79: 223–230. <http://dx.doi.org/10.1139/b00-144>
- Cole, M. S. & Hawksworth, D. L. 2001. Lichenicolous fungi, mainly from the USA, including *Patriciomyces* gen. nov. *Mycotaxon* 77: 305–338.
- Czyżewska, K., Motiejūnaitė, J. & Cieślinski, S. 2005. New and noteworthy species of lichens and allied fungi from North–Eastern Poland. *Acta Mycologica* 40: 277–291. <http://dx.doi.org/10.5586/am.2005.025>
- Darmostuk, V. V. 2015. *Codonmyces lecanorae* Calat. & Etayo is a new species of lichenicolous fungi for Ukraine. (In Ukrainian). *Chornomorski Botanical Journal* 11: 327–329.
- Diederich, P. 2003. New species and new records of American lichenicolous fungi. *Herzogia* 16: 41–90.
- Diederich, P., Sérusiaux, E. & van den Boom, P. 1991. Lichens et champignons lichénicoles nouveaux ou intéressants pour la flore de Belgique et des régions voisines. V. *Lejeunia nouvelle série* 136: 1–47.
- Diederich, P., Ertz, D., Eichler, M., Cezanne, R., van den Boom, P., van den Broeck, D. & Sérusiaux, E. 2014a. New or interesting lichens and lichenicolous fungi from Belgium, Luxembourg and northern France. XV. *Bulletin de la Société des naturalistes luxembourgeois* 115: 157–165.
- Diederich, P., Lawrey, J. D., Capdet, M., Pereira, S., Romero, A., Etayo, J., Flakus, A., Sikaroodi, M. & Ertz, D. 2014b. New lichen-associated bulbil-forming species of *Cantharellales* (Basidiomycetes). *The Lichenologist* 46: 333–347. <http://dx.doi.org/10.1017/S0024282913000583>
- Etayo, J. 1996. Aportación a la flora líquénica de las Islas Canarias. I. Hongos liquenícolas de Gomera. *Bulletin de la Société Linnéenne de Provence* 47: 93–110.
- Etayo, J. & Sancho, L. G. 2008. Hongos liquenícolas del Sur de Sudamerica, especialmente de Isla Navarino (Chile). *Bibliotheca Lichenologica* 98: 1–302.
- Gierl, C. & Kalb, K. 1993. Die Flechtengattung *Dibaeis*. Eine Übersicht über die rosafruchtigen Arten von *Baeomyces* sens. lat. nebst Anmerkungen zu *Phyllobaeis* gen. nov. *Herzogia* 9: 593–645.
- Grube, M. & Hafellner, J. 1990. Studien an flechtenbewohnenden Pilzen der Sammelgattung *Didymella* (Ascomycetes, Dothideales). *Nova Hedwigia* 51: 283–360.
- Hafellner, J. 1995. A new checklist of lichens and lichenicolous fungi of insular Laurimacaronesia including a lichenological bibliography for the area. *Fritschiana* 5: 1–132.
- Hafellner, J. 1996. Bemerkenswerte Funde von Flechten und lichenicole Pilze auf makaronesischen Inseln IV. Einige bisher libersehene lichenicole Arten der kanarischen Inseln. *Cryptogamie. Bryologie et Lichenologie*, 17: 1–14.
- Hawksworth, D. L. 1981. The lichenicolous Coelomycetes. *Bulletin of the British Museum (Natural History). Botany series* 9: 1–98.
- Hawksworth, D. L. 1983. A key to the lichen-forming, parasitic, parasymbiotic and saprophytic fungi occurring on lichens in the British Isles. *The Lichenologist* 15: 1–44. <http://dx.doi.org/10.1017/S0024282983000031>
- Heuchert, B. & Braun, U. 2006. On some dematiaceous lichenicolous hyphomycetes. *Herzogia* 19: 11–21.
- Hitch, C. J. B. (ed.) 2007. New, rare and interesting lichens. *British Lichen Society Bulletin* 101: 67–86.
- Kalb, K., Hafellner, J. & Staiger, B. 1995. Lichenicole Pilze auf Arten der Flechtengattung *Haematomma*. *Bibliotheca Lichenologica* 59: 199–222.
- Khodosovtsev, A. 2013. Lichen-forming and lichenicolous fungi from Aju-Dag Mt new to Ukraine and Crimea. (In Ukrainian). *Chornomorski Botanical Journal* 9: 84–88.
- Khodosovtsev, A. Ye., Darmostuk, V. V. 2016. *Pleospora xanthoriae* sp. nov. (Pleosporaceae, Pleosporales), a new lichenicolous fungus on *Xanthoria parietina* from Ukraine, with a key to the known lichenicolous species of *Dacampia* and *Pleospora*. *Opuscula Philolichenum* 15: 6–11.
- Khodosovtsev, A., Dymytrova, L., Nadyeina, A., Naumovych, A., Khodosovtseva, Yu. & Scheidegger, C. 2013. A contribution to beech forest-associated epiphytic lichen-forming and lichenicolous fungi in Crimean Mts (Ukraine). *Flora Mediterranea* 23: 57–68.
- Khodosovtsev, A. Ye. & Klymenko, V. M. 2015. *Didymellopsis perigena* (Nyl.) Grube and *Zwackhiomyces cervinae* Calat., Triebel & Pérez-Ortega (Xanthopyreniaceae, Ascomycota) new for Ukraine species of the lichenicolous fungi. (In Ukrainian). *Chornomorski Botanical Journal* 11: 217–222.
- Khodosovtsev, A., Vondrák, J., Naumovich, A., Kocourková, J., Vondrákova, O. & Motiejūnaitė, J. 2012. Three new *Pronectria* species in terricolous and saxicolous microlichen communities (Bionectriaceae, Ascomycota). *Nova Hedwigia* 95: 211–220. <http://dx.doi.org/10.1127/0029-5035/2012/0026>
- Kocourková, J. & Knudsen, K. 2009. Three lichenicolous fungi new for North America. *Evansia* 26(3): 148–151. <http://dx.doi.org/10.1639/0747-9859-26.3.148>
- Kukwa, M. & Czarnota, P. 2006. New or interesting records of lichenicolous fungi from Poland IV. *Herzogia* 19: 111–123.
- Kukwa, M. & Flakus, A. 2009. New or interesting records of lichenicolous fungi from Poland VII.

- Species mainly from Tatra Mountains. *Herzogia* 22: 191–211.
- Lettau, G. 1958. Flechten aus Mitteleuropa XIII. *Feddes Reperit* 61(1): 1–73. <http://dx.doi.org/10.1002/fedr.19580610102>
- Maharachchikumbura, S. S. N., Hyde, K. D., Groenewald, J. Z., Xu, J. & Crous, P. W. 2014. *Pestalotiopsis* revisited. *Studies in Mycology* 79: 121–186. <http://dx.doi.org/10.1016/j.simyco.2014.09.005>
- Martin, L., Suija, A., Schmeimann, M., Leppik, E. & Pykälä, J. 2012. New Estonian records and amendments: Lichenized and lichenicolous fungi. *Folia Cryptogamica Estonica* 49: 93–96.
- Mayrhofer, H., Türk, R. & Wittmann, H. 1989. Ein Beitrag zur Flechtenflora von Vorarlberg (Österreich): Ergebnisse der Feldtagung der Bryologisch-lichenologischen Arbeitsgemeinschaft für Mitteleuropa im Juli 1986. *Herzogia* 8: 207–247.
- Motiejūnaitė, J. 1999. Dzukijos nacionalinio parko kerpės ir su jomis susiję grybai [Lichens and allied fungi of Dzukija National Park]. *Botanica Lithuanica*, 5: 137–153.
- Motiejūnaitė, J., Berglund, T., Czarnota, P., Himelbrant, D., Högnabba, F., Konoreva, L. A., Korchikov, E. S., Kubiak, D., Kukwa, M., Kuznetsova, E., Leppik, E., Löhmus, P., Lukošienė, I. P., Juha, P., Stončius, D., Stepanchikova, I., Suija, A., Thell, A., Tsurykau, A. & Westberg, M. 2012. Lichens, lichenicolous and allied fungi found in Asveja Regional park (Lithuania). *Botanica lithuanica* 18(2): 85–100. <http://dx.doi.org/10.2478/v10279-012-0011-9>
- Naumovych A. O., Darmostuk V. V. 2015. Lichenicolous fungi of the valley of Ingulets river (Ukraine). (In Ukrainian). *Chornomorski Botanical Journal* 11 (4): 512–520.
- Roux, C. & Navarro-Rosines, P. 1994. *Stigmatidium clauzadei* sp. nov., nelikeniginta fungo likenloga (Ascomycetes). *Bulletin de la Société linnéenne de Provence* 45: 443–450.
- Sandstede, H. 1906. Die *Cladonien* des nordwestdeutschen Tieflandes und der deutschen Nordseeinseln. *Abhandlungen herausgegeben vom Naturwissenschaftlichen Verein zu Bremen* 18: 384–457.
- Sandstede, H. 1931. Die Gattung *Cladonia*. In *Raben host's Kryptogamen-Flora von Deutschland, Österreich und der Schweiz* (A. Zahlbruckner, ed). Vol. 9 (4,2). Leipzig: Akademische Verlagsgesellschaft.
- Scholz, P. 1998. *Phacopsis doerfeltii*, sp. nov., and two other interesting lichenicolous fungi from Canada. *Sauteria* 9: 37–42.
- Sérusiaux, E., Diederich, P., Brand, A. M. & van den Boom, P. 1999. New or interesting lichens and lichenicolous fungi from Belgium and Luxembourg VIII. *Lejeunia* 162: 1–95.
- Söchting, U., Alstrup, V., Kocourková, J., Vondrak, J. & Spiegelberg, R. 2007. Additions to the lichen and lichenicolous flora of Denmark VII. *Graphis Scripta* 19: 40–47.
- Suija, A., Czarnota, P., Himelbrant, D., Kowalewska, A., Kukwa, M., Kuznetsova, E., Leppik E., Motiejūnaitė J., Piterāns A., Schiefelbein U., Skazina M., Sohrabi M., Stepanchikova I., & Veres, K. 2010. The lichen biota of three nature reserves in island Saaremaa, Estonia. *Folia Cryptogamica Estonica* 47: 85–96
- Suija, A., Leppik, E., Jüriado, I., Löhmus, P., Marmor, L., & Saag, L. 2011. New Estonian records and amendments: Lichenized, lichenicolous and allied fungi. *Folia Cryptogamica Estonica* 48: 154–158.
- Sun, H. J., Depriest, P. T., Gargas, A., Rossman, A. Y. & Friedmann, E. I. 2002. *Pestalotiopsis maculans*: a dominant Parasymbiont in North American Lichens. *Symbiosis* 33: 215–226.
- Suryanarayanan, T. S., Thirunavukkarasu, N., Nariharan, G. N. & Balaji P. 2005. Occurrence of non-obligate microfungi inside lichen thalli. *Sydowia* 57: 120–130.
- Thell, A., Alstrup, V., Arup, U., Bendiksby, M., Czarnota, P., Feuerer, T., Haugan, R., Kärnefelt, I., Klepsland, J. T., Kukwa, M., Launis, A., Millanes, A. M., Motiejūnaitė, J., Nordin, A., Prieto, M., Pykälä, J., Seaward, M. R. D., Timdal, E., Tsurykau, A., Vitikainen, O. & Westberg, M. 2014. New or interesting lichens and lichenicolous fungi from the Vadstena area, Östergötland, Sweden. *Graphis Scripta* 26: 15–33.
- Triebel, D. & Scholz, P. 2001. Lichenicolous fungi from Bavaria as represented in the Botanische Staatssammlung München. *Sendtnera* 7: 211–231.
- Tsurykau, A., Golubkov, V. & Kukwa, M. 2014. New or otherwise interesting records of lichens and lichenicolous fungi from Belarus. *Herzogia* 27(1): 111–120. <http://dx.doi.org/10.13158/heia.27.1.2014.111>
- Türk, R. & Wittmann, H. 1987. Flechten im Bundesland Salzburg (Österreich) und im Berchtesgadener Land (Bayern, Deutschland) – die bisher beobachteten Arten und deren Verbreitung. *Sauteria* 3: 1–313.
- Urbanavichus, G., Gabibova, A. & Ismailov, A. 2011. New records of lichens and lichenicolous fungi for Russia and the Caucasus. *Turkish Journal Of Botany* 35: 291–297.
- Urbanavichus, G. & Urbanavichene, I. 2015. New records of lichens and lichenicolous fungi from the NW Caucasus (Russia). *Herzogia* 28(1): 185–192. <http://dx.doi.org/10.13158/heia.28.1.2015.185>
- van den Boom, P. 2002. Some interesting records of lichens and lichenicolous fungi from The Netherlands 5. *Österreichische Zeitschrift für Pilzkunde* 11: 153–157.
- van den Boom, P., Diederich, P. & Sérusiaux, E. 1996. Lichens et champignons lichénicoles nouveaux ou intéressants pour la flore de la Belgique et des régions voisines. VII. *Bulletin de la Société des naturalistes luxembourgeois* 97: 81–92.

- Zhurbenko, M. P. 1998. Lichens and lichenicolous fungi from the north of Pyasino lake, Taymyr Peninsula, Siberia. *Folia Cryptogamica Estonica* 32: 153–159.
- Zhurbenko, M. P. 2004. Lichenicolous and some interesting lichenized fungi from the Northern Ural, Komi Republic of Russia. *Herzogia* 17: 77–86.
- Zhurbenko, M. P. 2012. New records of lichenicolous fungi from State Nature Reserve “Stolby” (Krasnoyarsk territory). (In Russian). *Novitates systematicae plantarum non vascularium* 46: 92–95.
- Zhurbenko M. P. 2013a. A first list of lichenicolous fungi from India. *Mycobiota* 3: 19–34. <http://dx.doi.org/10.12664/mycobiota.2013.03.03>
- Zhurbenko, M. P. 2013b. Lichenicolous fungi and some allied lichens from the Canadian Arctic. *Opuscula Philolichenum* 12: 180–197.
- Zhurbenko, M. P. & Brackel, W. von. 2013. Checklist of lichenicolous fungi and lichenicolous lichens of Svalbard, including new species, new records and revisions. *Herzogia* 26: 323–359. <http://dx.doi.org/10.13158/hea.26.2.2013.323>
- Zhurbenko, M. P. & Himelbrant, D. E. 2002. Lichenicolous fungi from the Kandalaksha Gulf, Karelia Keretina, Russia. *Folia Cryptogamica Estonica* 39: 51–59.
- Zhurbenko, M. P. & Santesson, R. 1996. Lichenicolous fungi from the Russian Arctic. *Herzogia* 12: 147–161.
- Zhurbenko, M. P., Frisch, A., Ohmura, Y. & Thor, G. 2015. Lichenicolous fungi from Japan and Korea: new species, new records and a first synopsis for Japan. *Herzogia* 28: 762–789. <http://dx.doi.org/10.13158/hea.28.2.2015.762>
- Zhurbenko, M., Santesson, R., Walker, D. A., Auerbach, N. A. & Lewis, B. 1995. New and interesting lichenicolous fungi and lichens from Alaska. *Evansia* 12(3): 92–97.

